

Work Order ID **116459**

April-16-14 11:00:23 AM

116459

Page 1

Item ID: D407-667-205 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Aft Crosstube
 Start Date: 4/16/14 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 5/01/14 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: MLS Date: 14-04-16 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D407-667-245	Rev F/DEO								
100	Document Control	0.00							
100	DOCUMENT CONTROL								
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy bluefile and create labels as per PPP D407-667-205 CHG008								
110	Pick Kit	0.00							
110	Packaging								
Packaging	Memo	0.00							
Packaging									
120		0.00							
120	BENDING MACHINE - CROSSTUBES								
CNC Bend 1	Memo	0.00							
CNC Delta 100 Bender	1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21								

MAY 13 2014

DAS
06
9-89

ONE

BL/TW 14-04-17

TW 14-04-21

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 2

Item ID: D407-667-205

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

130

QC

Memo

0.00

Quality Control

DAS
03
9-89

14-4-22



Work Order ID: 116459

April-16-14 11:00:23 AM

116459

Page 3

Item ID: D407-667-205

Accept

N900040100

Setup Start *NS1*

Revision ID:

Item Name: Aft Crosstube

Stop *NS2*

Start Date: 4/16/14 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

140

0.00

140

Crosstubes

0.00

Crosstubes

Crosstubes

Memo

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: [Signature] *****

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes. Holes facing inboard. Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: [Signature] *****

2- Drill fwd rivet holes using drill Jig DT8787 fwd as per Dwg D407-667-245. Note: FWD side has 3X top holes facing inboard.

3- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

4- Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. Drill ONLY 2 top holes ONLY plug most bottom hole to prevent accidental drilling. Drill holes and ream using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes. Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: [Signature] *****

5-Drill aft rivet holes using drill Jig DT8787 aft as per Dwg D407-667-245.

[Signature] 14-04-13

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 4

Item ID: D407-667-205

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Drill only the top (2) holes.

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: *[Signature]* *****

6- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

7- Scribe tube to identify on the inner chamfer in the cuff D# and B#

8-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***Debur
& Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245

150

QC5- Inspect part completeness to step on W/O

0.00

150

DAS
16
9-89

QC

Memo

0.00

14/04/23

Quality Control

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

14-04-23

14-04-23

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 5

Item ID: D407-667-205

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160		0.00							
160									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	1- CLEAN CROSSTUBE WITH WASH'N WIPE								
180	Outsource process - NDT per QSI038 4.1	0.00							
180									
Outsource2	Memo	0.00							
Outsource process - NDT	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	Liquid Penetrant Inspection as per QSI 0380								
	Issue P/O: <u>2323</u> LPI as per ASTM 1417								
	Level 2 Attach copy of NDT results to work order								
190	Packaging	0.00							
190									
Packaging	Memo	0.00							
Packaging	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	Ensure copy of NDT results attached to work order.								

1 0 0 AS
14-4-24

CZ 14/04/25 ①

14/4/25 ①

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 6

Item ID: D407-667-205

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200	QC5- Inspect part completeness to step on W/O	0.00							
200									
QC	Memo	0.00							
Quality Control	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
204		0.00							
204									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	1- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN CROSSTUBE BEFORE CHEMICAL CONVERSION								
206	QC7-Inspect Chemical Conversion Coat	0.00							
206									
QC	Memo	0.00							
Quality Control	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								

DAS
27
9-89
11/14/25

83/KL 14-04-24
1/00

1/00 14-4-25

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 7

Item ID: D407-667-205

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	SprayPaint	0.00							
210									
SprayPaint	Memo	0.00							
Spray Painting	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	Mask underside of crosstube as shown								
	1-Prime inside and outside crosstube as per DEO D407-667-245 and QSI 005 4.2								
	2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PRIME: 128820								
	Start Time: 1:30								
	Finish Time: 2:15								
	clear 128464								
	PAINT: 128840								
	Start Time: 7:00								
	Finish Time: 7:45								
220	QC14- Inspect Spray Paint	0.00							
220									
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								

SHP
M/S/S

14-5-5

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 8

Item ID: D407-667-205

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

0.00

230

Crosstubes

Crosstubes

0.00

Memo

1- Install chafing shield as per DEO D407-667-245. Top holes should be facing up.

A/R Proseal 890 Batch: 128712
EXP: 10/14

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

3- Install support with Scotch-Weld DP460 and install clamps as per DEO Dwg D407-667-245 using installation jig DT9025. Torque clamps as per dwg

A/R Scotch-Weld DP460 Batch: M726005
EXP: exp 3/1/14

LET CURE FOR 24 HOURS

CURE TIME:

START: 14-5-8

FINISH: 14-5-9

4- Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.

CR 14-05-06

1 0 0 14-5-8

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 9

Item ID: D407-667-205

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	QC5- Inspect part completeness to step on W/O	0.00							
240		DAS							
QC		16							
Quality Control	Memo	9-89							
	RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURE FOR 24HOURS AS PER DWG DEO	0.00							
250	Pick Kit	0.00							
250									
Packaging									
Packaging	Memo	0.00							
260	QC4- 100% Inspect kits for completeness	0.00							
260									
QC									
Quality Control	Memo	0.00							

DAS
32
9-89

14/5/12 ①

DAS
28
9-89

DAS
06
9-89

MAY 13 2014

Work Order ID 116459

April-16-14 11:00:23 AM

116459

Page 10

Item ID: D407-667-205

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 4/16/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/01/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

270

270

Packaging

Packaging

Packaging

Memo

Identify and in kanban rack

Location: 113

0.00

0.00

MAY 15 2014

1X

DAS
28
9-89DAS
06
9-89

280

280

QC

Quality Control

QC21- Final Inspection - Work Order Release

Memo

0.00

0.00

14/5/15

14-5-15

Picklist Print

April-16-14 11:00:27 AM

Page 1

Work Order ID: 116459

116459

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube

Start Date: 4/16/14

Required Date: 5/01/14

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell SkidtubesKJ/JLM
IPP Rev:D Added Magnobond,Rubber Cushion & Clamps 07-02-19
JLM

CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER

IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified
by:EC

IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC

IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC

IPP Rev H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I

10.04.07 revise route seq. in bom DD verified by:JLM IPP Rev J 11.04.26

removed abrasion strip ecn 11-551 EC verified

by:DD

IPP REV:K

11.10.03 DEO D407-667-245-F-2 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205TRN		Manufactured	No			110	Each	10.0000	1	1			

D407-667-205TRN

Crosstube Turning Detail

Location	Loc Qty	Loc Code
LG	3	
105222	1	
115331	1	
115363	1	
LG014	7	
105224	1	
105225	1	
108604	1	
108606	1	
108607	1	
115332	1	
115334	1	

BL/

14-04-17

Picklist Print

April-16-14 11:00:27 AM

Page 2

Work Order ID: 116459

116459

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube

Start Date: 4/16/14

Required Date: 5/01/14

Start Qty: 1.00

Required Qty: 1.00

D2873-043

Manufactured No

230

Each

116.0000

2

2

D2873-043

Nut Plate Assembly

CR 14-04-26

Location

Loc Qty

Loc Code

LG052

116

104871

1

107964

10

112264

25

113050

40

114550

40

2

D2873-045

Manufactured No

230

Each

119.0000

2

2

D2873-045

Nut Plate Assembly

CR 14-04-26

Location

Loc Qty

Loc Code

LG

34

112430

34

LG052

85

108829

5

113144

40

113886

40

2

D2894-1

Manufactured No

230

Each

18.0000

1

1

D2894-1

2.75 Support

CR 14-05-06

Location

Loc Qty

Loc Code

LG052

18

103950

2

105623

6

113132

10

1

Picklist Print

April-16-14 11:00:27 AM

Page 3

Work Order ID: 116459

116459

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube

Start Date: 4/16/14

Required Date: 5/01/14

Start Qty: 1.00

Required Qty: 1.00

D3190-1 Manufactured No

230 Each 43.0000 2 2

D3190-1

Chaffing Shield

**

CR 14-05-06

Location Loc Qty Loc Code

LG053 43

105834 29

109948 14

D3595-063-450 Manufactured No

230 Each 85.0000 2 2

D3595-063-450

Rubber Cushion

**

CR 14-05-06

Location Loc Qty Loc Code

FG 15

88422 5

94274 10

LG 15

111538 15

LG051 55

109526 2

113323 28

115271 25

MS20601-AD4W8 Purchased No

230 Each 653.0000 14 14

MS20601-AD4W8

RIVET

**

CR 14-04-20

Location Loc Qty Loc Code

ST311 653

M126637 24

M127813 129

M128429 200

M128650 300

April-16-14 11:00:27 AM

Shop Packet Print

Page 3

Picklist Print

April-16-14 11:00:27 AM

Page 4

Work Order ID: 116459

116459

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube

Start Date: 4/16/14

Required Date: 5/01/14

Start Qty: 1.00

Required Qty: 1.00

MS21920-22 Purchased No 230 Each 307.0000 4 4

MS21920-22

Clamp

ea 14-05-06

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	200	
M128636	200	
LG050	107	
M127255	40	
M127608	19	
M128199	48	

4

MS21920-25 Purchased No 230 Each 86.0000 2 2

MS21920-25

Clamp

CR 14-05-06

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
FG	2	
120920	2	
LG050	84	
M127823	25	
M128012	9	
M1285701	25	
M128718	25	

2

NAS1149D0563J Purchased No 230 Each 4,532.000 18 18

NAS1149D0563.J

Washer

DAS
32
9-89

14/5/14 (1)

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
GA	201	
m125807	201	
ST510a	4331	
m126319	2331	
m128257	2000	

m126319

DAS
28
9-89

68-6
90
DAS

April-16-14 11:00:28 AM

Shop Packet Print

Page 4

Picklist Print

April-16-14 11:00:28 AM

Page 5

Work Order ID: 116459

116459

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube

Start Date: 4/16/14

Required Date: 5/01/14

Start Qty: 1.00

Required Qty: 1.00

AN5-10A Purchased No 250 Each 674.0000 10 10

AN5-10A

BOLT

DAS
32
9-89

DAS
06
9-89

Location

Loc Qty

Loc Code

GA	101
122800	101
ST362	366
M127432	66
M128634	300
st503	207
M126180	207

m1286 34

DAS
28
9-89

AN5-32A Purchased No 250 Each 446.0000 4 4

AN5-32A

Bolt

DAS
32
9-89 6/10/12 (1)

DAS
06
9-89

Location

Loc Qty

Loc Code

ST337	114
124215	110
m127363	4
st503	182
m127550	30
m128403	152
ST504	150
m128634	150

m128403

DAS
28
9-89

April-16-14 11:00:28 AM

Shop Packet Print

Page 5

Picklist Print

April-16-14 11:00:28 AM

Page 6

Work Order ID: 116459

116459

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube

Start Date: 4/16/14

Required Date: 5/01/14

Start Qty: 1.00

Required Qty: 1.00

AN5-34A

Purchased

No

250

Each

206.0000

4

4

DAS

AN5-34A

Bolt

32
9-89

DAS
06
9-89

Location

Loc Qty

Loc Code

ST338

106

m126176

6

m127817

14

m127933

36

m128403

50

st503

100

m128634

100

DAS
28
9-89

m127933

MS21042L5

Purchased

No

250

Each

1,603.000

4

4

DAS
32
9-89

MS21042L5

Nut

14/01/12

DAS
06
9-89

Location

Loc Qty

Loc Code

GA

5

117611

5

ST315

98

m127304

98

ST509

1500

m127813

500

m128810

1000

DAS
28
9-89

m128810

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

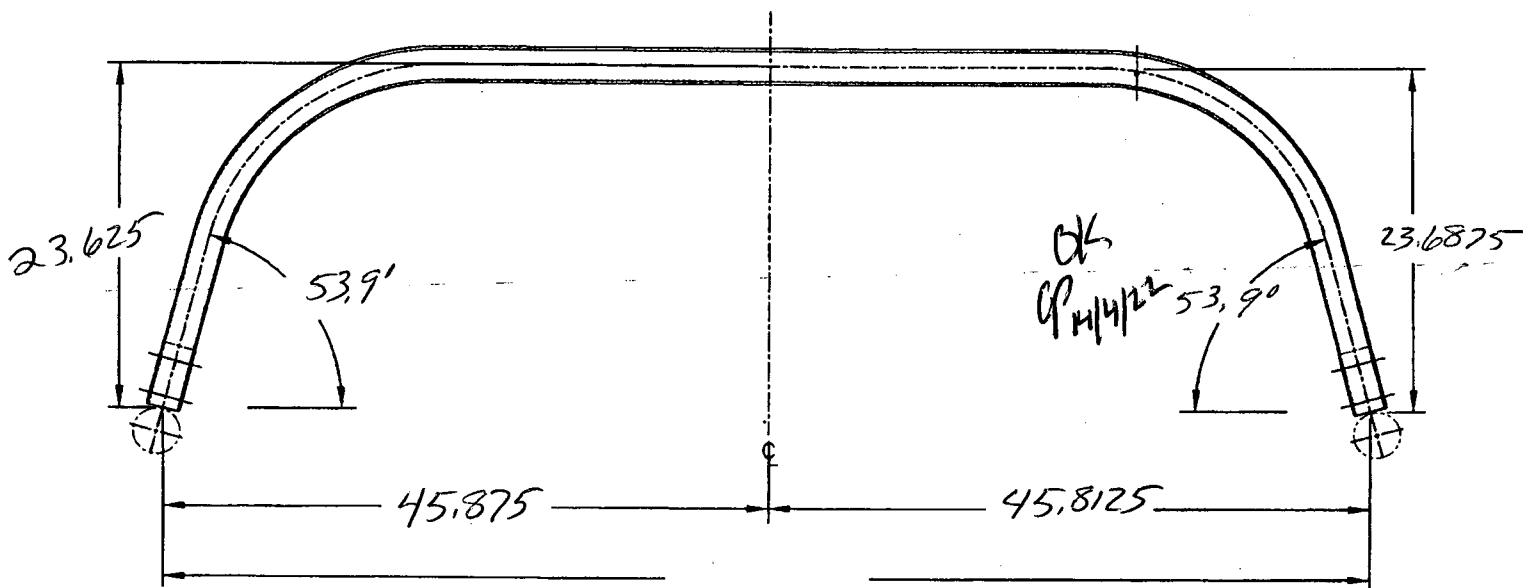
Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Crimp/Kink/Ripple/Wave <input type="checkbox"/> Cuffs <input type="checkbox"/> Crushing <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Marks/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
--	--	---	--

DART AEROSPACE LTD		Work Order:	116459
Description: Crosstube High Aft (407)		Part Number:	D407-667-205
Inspection Dwg: D407-667-245	Rev: F		Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100
Bending Passes	6	--
Crushing	--	6%



	Side A	Side B
Bending Passes	28	28
Crushing	4.9%	4.6%
Comments		

DAS
03
9-89

QC15 Inspection	DP
Date	11-4-22

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	
E	12.04.16	Added bending, crushing dimensions	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND
6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO
PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE
OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

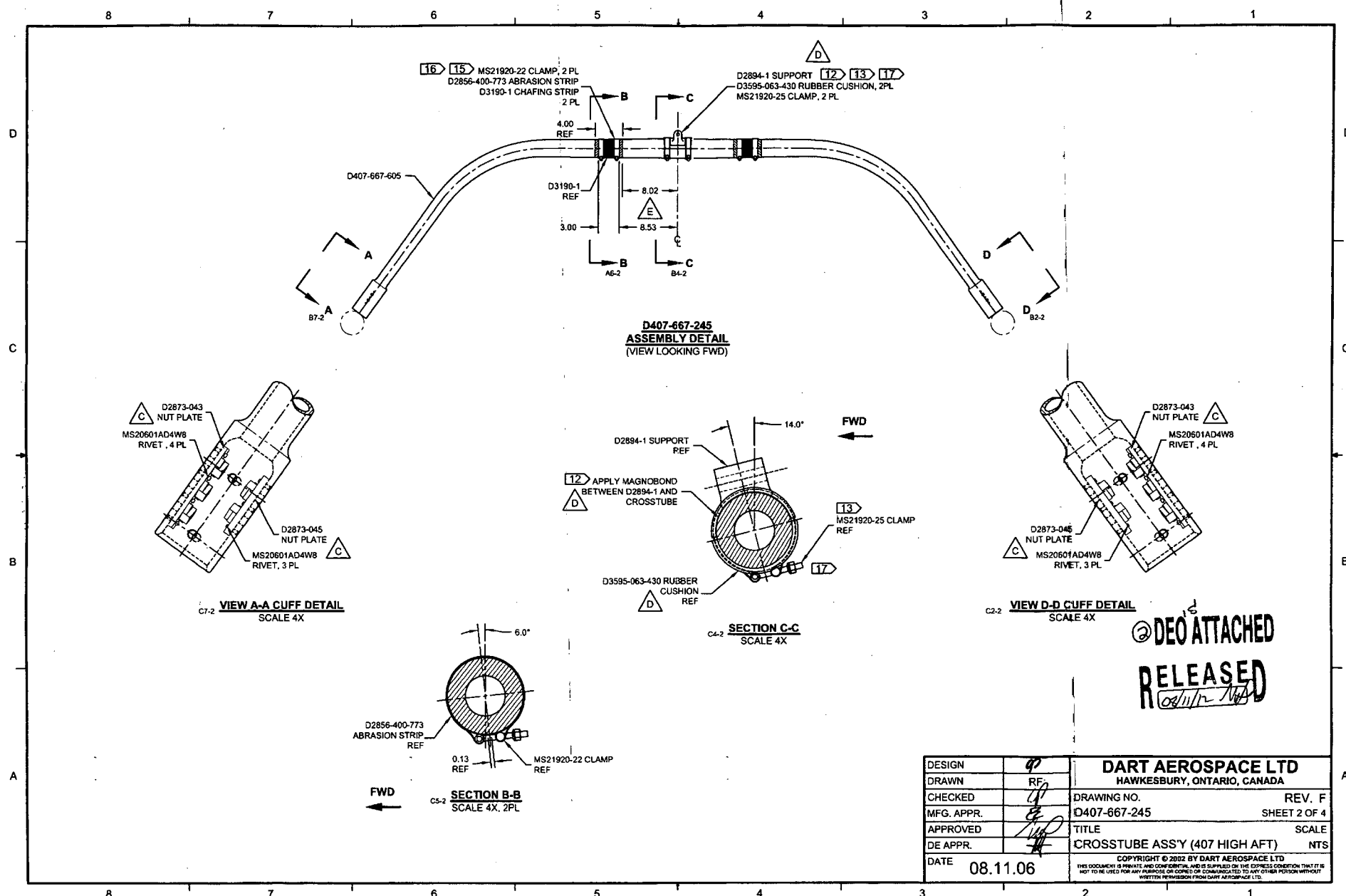
116459 MLS

14-04-16 @ DEO ATTACHED

RELEASED
08/11/12 N/A

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: FAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	90		
DRAWN	RF		
CHECKED	40		
MFG. APPR.	40		
APPROVED	40		
DE APPR.	40		
DATE	08.11.06		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D407-667-245	REV. F SHEET 1 OF 4
TITLE CROSSTUBE ASSY (407 HIGH AFT)	SCALE NTS
COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



DEO ATTACHED
 RELEASED
 08/11/06

D407-667-245 MACHINING DETAIL

RELEASED
08/11/12

VIDEO ATTACHED

SEE DETAIL M
A7-4

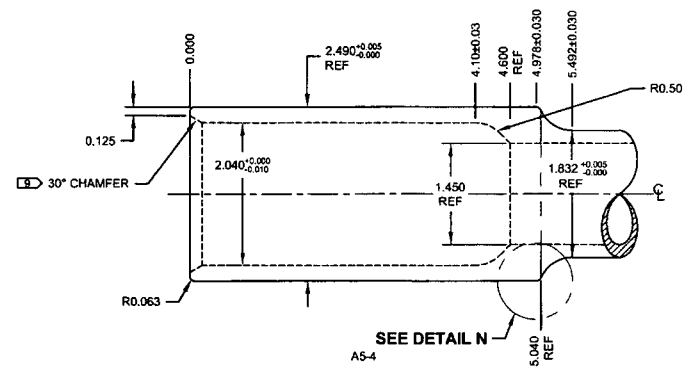
R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

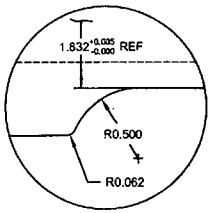
R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

SEE DETAIL P
A2-4

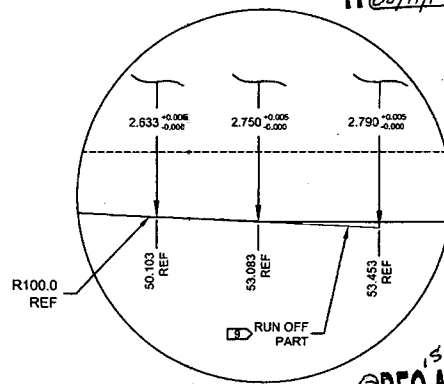
TAPER UNIFORMLY FROM
2.633 \pm 0.005 REF THROUGH TO 2.790 \pm 0.005 REF
RUNNING OFF PART



DETAIL M: CROSS TUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	JP	DRAWING NO.	REV. F
MFG. APPR.	JP	D407-667-245	SHEET 4 OF 4
APPROVED	JP	TITLE	SCALE
DE APPR.	JP	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN <i>A</i>	CHECKED <i>97</i>	MFG. APPR. <i>E</i>	APPROVED <i>140</i>		DE APPR. <i>H</i>		
DATE 11.04.08	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12		DATE 11.04.12		

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Item	Qty -245	Part Number	Description
3	0	D2856-400-773	ABRASION STRIP

WAS:

3	2	D2856-400-773	ABRASION STRIP
---	---	---------------	----------------

NOTES 2 AND 15, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT
- 15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1
CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL
PROSEALED D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT
OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 REF GAP ON BOTTOM SIDE OF
CROSSTUBE PER QSI 035.

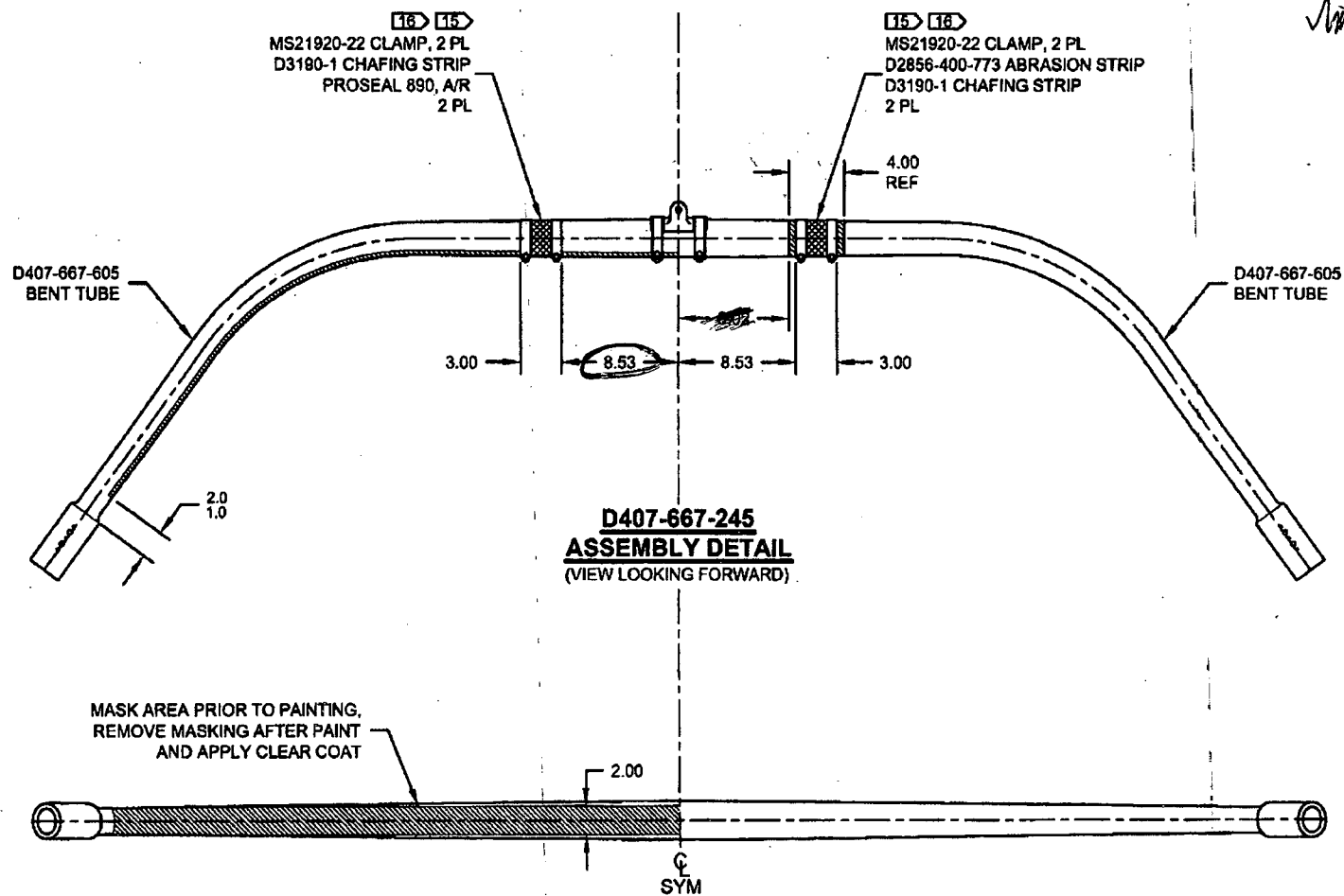
RELEASED
2011-04-18
H

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>UP</i>	MFG. APPR. <i>EZ</i>	APPROVED <i>WP</i>	DE APPR. <i>TH</i>		
DATE 11.04.08	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12		

IS:

WAS:

RELEASED
2011-04-18
WP



COPYRIGHT © 2011 BY DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASS'Y (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-245-F-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>JP</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>ES</i>	APPROVED <i>MP</i>		DE APPR. <i>TH</i>		
DATE 11.09.07	DATE 11.09.19	DATE 11.09.19	DATE 11.09.19		DATE 11.09.19		

PURPOSE:

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

Item	Qty -245	Part Number	Description
12	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
----	-----	----------------	---

NOTE 12 & 17, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

WAS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-09-29
MP

COPYRIGHT © 2011 BY DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

Page: 1 of 1

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO20028	Customer: Cash Sale	Dept: NDT YUL	Reference: 23923
Descr:	PN: DART AEROSPACE	SN:	Qty: 1
Make:	Model:	Reg:	A/C SN:
TSN: 0	CSN: 0	TSO: 0	
Task:			Sequence: 0

Work Required:

CARRY OUT NDT ON THE FOLLOWING CROSSTUBES ID D407-667-205

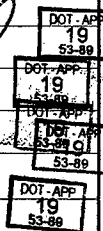
- ① WORK ORDER ID 116462
- ② WORK ORDER ID 112867
- ③ WORK ORDER ID 112863
- ④ WORK ORDER ID 116465
- ⑤ WORK ORDER ID 116459

DAS
27
9-89

Action Taken: Date: Initial/Stamp:

LIQUID PENETRANT INSPECTION CARRIED OUT
ON AFT CROSSTUBES D407-667-205
IAW ASTM E1417-M13

- ① W.O. ID 116462 - NO CRACKS FOUND 24 APR 14
- ② W.O. ID 112867 - NO CRACKS FOUND 24 APR 14
- ③ W.O. ID 112863 - NO CRACKS FOUND 24 APR 14
- ④ W.O. ID 116465 - NO CRACKS FOUND 24 APR 14
- ⑤ W.O. ID 116459 - NO CRACKS FOUND 24 APR 14



Description	Location	P/N	Qty	Batch	S/N Off	S/N On
PENETRANT	ARDBOX	970-P-2SE		TPD10484		
BLACK LIGHT	M20189					

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	ACA/SCA Stamp DOT APP 19 53-89	Date: 24 APR 2014
Name: GARY SMITH		